



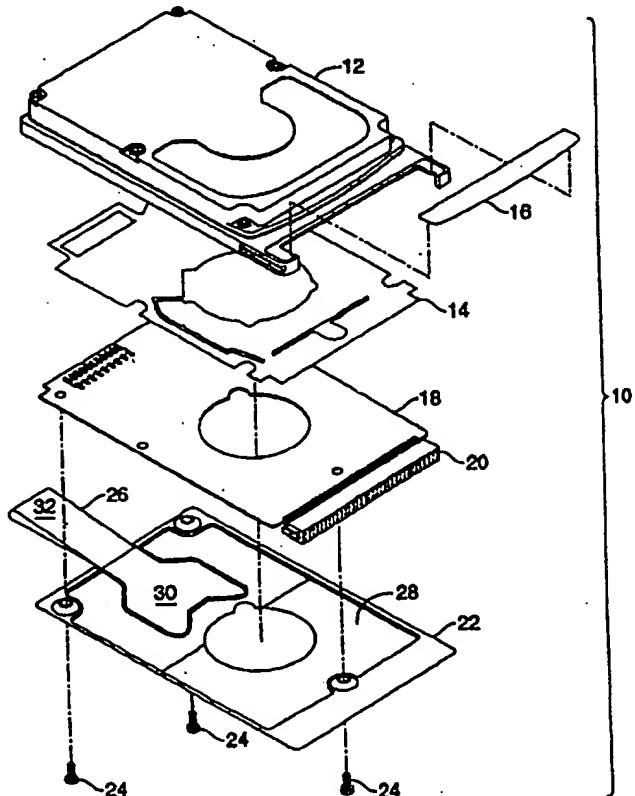
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: FLEXIBLE PULL TAB FOR PCMCIA ELECTRONICS PACKAGES

## (57) Abstract

A miniature disk drive (12) or other electronics package, for example a modem, which is designed to be removably connected to a PCMCIA type I, II, III, or IV interface receptacle of a computer or expansion chassis is provided with a PCMCIA-type interface connector (20) for connection to the PCMCIA interface and a pull tab (26) on the electronics package directly opposite the connector. The pull tab is flexible and tear resistant and is mounted to the PCMCIA electronics package so that when the tab is pulled, the PCMCIA electronics package may be pulled from the PCMCIA receptacle regardless of how much of the PCMCIA electronics package protrudes from the computer or expansion chassis. Accordingly, the PCMCIA electronics package may be made smaller in length than would otherwise be necessary in order for a user to retrieve it from the PCMCIA slot.



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TITLE OF THE INVENTION

## FLEXIBLE PULL TAB FOR PCMCIA ELECTRONICS PACKAGES

BACKGROUND OF THE INVENTION1. Field of the Invention

This invention relates to the field of miniature electronics packages which interface to other electronic devices by means of a PCMCIA-type interface. More particularly, this invention is related to PCMCIA-type electronics packages such as hard disk drives and modems which interface to computers via PCMCIA type I (single height), type II (double height), type III (triple height), and type IV (quadruple height), etc. interface connectors.

2. The Prior Art

Miniature hard disk drives which interface to a computer via a PCMCIA-type interface were introduced by MiniStor Peripherals Corporation of San Jose, California at a press conference in San Jose, California in March of 1992. Hard disk drives of this type are described more fully in co-pending U.S. Patent Application serial no. 08/035,458 filed March 23, 1993 which is hereby incorporated herein by reference as if set forth fully herein. PCMCIA-type drives provide a convenient pocket-

sized mass storage medium which can be easily carried from computer to computer by a user. Other PCMCIA-type devices include modems, RAM modules, flash memory modules, ethernet adapters and the like and are presently available from a wide variety of vendors.

The PCMCIA interface connector is a 68 pin connector which requires force to engage and disengage. While engaging the interface connectors is quite straightforward and can be accomplished by simply pushing the PCMCIA-type electronics package into the mating receptacle on the computer or expansion chassis, removal can be a little more complicated where the PCMCIA electronics package does not protrude much from the computer or expansion chassis slot where it attaches to the computer. In some cases pliers and other tools are required in order to remove the PCMCIA electronics package from its slot.

#### OBJECTS AND ADVANTAGES OF THE INVENTION

Accordingly, it is an object of the present invention to provide an improved PCMCIA electronics package structure which facilitates removal of the PCMCIA electronics package from the PCMCIA slot.

These and many other objects and advantages of the present invention will become apparent to those of ordinary skill in the art from a consideration of the drawings and ensuing description of the invention.

SUMMARY OF THE INVENTION

A miniature disk drive or other miniature electronics package such as, for example, a modem, which is designed to be removably connected to a PCMCIA type I, type II, type III, or type IV interface receptacle of a computer or expansion chassis is provided with a PCMCIA-type interface connector for connection to the PCMCIA interface and a pull tab on the side of the electronics package directly opposite the side of the electronics package on which is mounted the PCMCIA-type interface connector. The pull tab is flexible and tear resistant and is mounted to the PCMCIA electronics package so that when the tab is pulled, the PCMCIA electronics package may be pulled from the PCMCIA receptacle regardless of how much of the PCMCIA electronics package protrudes from the computer or expansion chassis. Accordingly, the computer or expansion chassis may fully enclose the PCMCIA electronics package while the package remains easily removable with the pull tab. Also, the PCMCIA electronics package may be made smaller in length than would otherwise be necessary in order for a user to retrieve it from the PCMCIA slot.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front top perspective exploded view of a PCMCIA electronics package according to a preferred embodiment of the present invention.

FIGS. 2A-2F show the construction and assembly of a pull tab according to a presently preferred embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Those of ordinary skill in the art will realize that the following description of the present invention is illustrative only and is not intended to be in any way limiting. Other embodiments of the invention will readily suggest themselves to such skilled persons from an examination of the within disclosure.

According to a preferred embodiment of the present invention, a pull tab is provided on an electronics package or "card" designed to meet the well known PCMCIA specifications. According to these specifications which are well known to those of skill in the art, A PCMCIA interfaceable electronics package occupies a volume having a width of about 5.4 cm (the specification calls for a width of 54 mm +/- 0.1 mm), a length of about 8.6 cm (86 mm) or less, and a height of 0.33 cm (3.3 mm) in the case of a PCMCIA Type-I card, a height of 0.50 cm (5.0 mm) in the case of a PCMCIA Type-II card, a height of 1.05 cm (10.5 mm) in the case of a PCMCIA Type-III card, a height of 1.25 cm (12.5 mm) or greater in the case of a PCMCIA Type-IV card. Technically the PCMCIA Type-IV has yet to be approved by the standards committee for PCMCIA cards, however, as used herein a Type-IV

card refers to cards thicker (of greater height) than a Type-III card. A 68-socket female PCMCIA connector is disposed at one end of the card and positioned so as to mate with a mating male 68-pin PCMCIA connector in a corresponding PCMCIA Type-I, Type-II, Type-III, or Type-IV slot in a computer or expansion chassis (collectively referred to herein as a "computing device"). In the common configuration used in notebook computers manufactured, for example, by I.B.M. of Armonk, New York and Toshiba of Japan, the PCMCIA interface consists of a recessed slot in the notebook computer with the male PCMCIA connector located all the way inside the slot. In use, the PCMCIA cards are inserted into the slot and pushed into engagement with the PCMCIA connector in the slot.

Because it is generally considered to be undesirable to have objects protruding very far from the notebook computer, most PCMCIA slots are designed to contain most or all of the body of the PCMCIA card. This feature can make retrieval of the PCMCIA card from the slot difficult at times, particularly where the PCMCIA card has a relatively short length.

In accordance with the present invention, a pull tab is provided which is securely fixed to a PCMCIA electronics package and which can be used as an aid in retrieving a PCMCIA card from its slot in a computing device.

Turning now to the drawings, FIG. 1 is an exploded perspective drawing of a PCMCIA disk drive card 10 according to a

first preferred embodiment of the present invention. Drive card 10 comprises the disk drive mechanical package 12, an insulation sheet 14, a cover plate 16, the disk drive electronics contained on a printed circuit board 18 which includes female 68-socket PCMCIA connector 20. A bottom cover plate 22 is also included which is attached to the rest of the package by screws 24 which hold the entire assembly together as shown. Pull tab 26 is also included and extends from the card on the side directly opposite the PCMCIA connector 20. According to a first preferred embodiment, pull tab 26 is adhered to the upper portion 28 of bottom cover plate 22 and comprises an attachment portion 30 and a loop portion 32. The attachment portion 30 is, in the final assembly of the card 10 contained within the card and adhered to bottom cover plate 22 and the loop portion 32 extends outside card 10 and may be used as a retrieval aid for getting the card out of a corresponding PCMCIA slot.

Turning now to FIGS. 2A-2F the details of the pull tab according to a first preferred embodiment of the invention are shown. In FIG. 2A the basic pull tab preform 34 is shown. Pull tab preform 34 comprises a lower portion 36, a top portion 38, and a rubber adhesive portion 40. Lower portion 36 is preferably fabricated from a polyester tape such as 3M type 8422 tape approximately 0.0014 in (0.0036 cm) thick. To the top of lower portion 36 is adhered rubber adhesive portion 40. 3M type 8422 tape includes the polyester film and the rubber adhesive. Other

equivalent materials could also be used as would be known to those of skill in the art. The total thickness of lower portion 36 and rubber adhesive portion 40 is about 0.0025 in (0.0064 cm).

Referring now to FIG. 2B, top portion 38 comprises three horizontal sections. First top section 42, second top section 44 and third top section 46. First top section 42 is preferably a paper release material which can be removed to expose adhesive layer 40 below first top section 42. Third top section 46 is similarly preferably a paper release material which can be removed to expose adhesive layer 40 below third top section 46. Second top section 44 is preferably a fabric material, resistant to tearing, such as Industrial Coatings Group, Inc. Type Arrestox B, which is fully adhered to adhesive layer 40. Similar materials could also be used as would be known to those of skill in the art.

Assembly of the pull tab proceeds as shown in FIGS. 2C-2F. First top section 42 is removed and lower portion 36 is doubled over and adhered to itself as shown in FIG. 2C to form the subassembly shown in FIG. 2D. Next, the subassembly is folded in half as shown in FIG. 2E to form the subassembly shown in FIG 2F. Finally, the third top section 46 is removed to expose the rubber adhesive layer 40 and the pull tab assembly is then adhered to the upper portion 28 of bottom cover plate 22 as shown in FIG. 1.

Those of skill in the art will readily see that other

pull tab configurations could be used, such as a full fabric pull tab, attachment by hardware instead of or in addition to adhesive, and the like.

While illustrative embodiments and applications of this invention have been shown and described, it would be apparent to those skilled in the art that many more modifications than have been mentioned above are possible without departing from the inventive concepts set forth herein. The invention, therefore, is not to be limited except in the spirit of the appended claims.

CLAIMS

What is claimed is:

1. A PCMCIA electronics package comprising:  
a body containing an electrical device interfaceable to  
a computing device through a PCMCIA interface;  
a female PCMCIA connector disposed at one end of said  
body;  
a flexible pull tab extending from an end directly  
opposite said one end of said body.
2. The PCMCIA electronics package of claim 1 wherein  
said flexible pull tab is adhesively anchored to an interior wall  
of said body.
3. The PCMCIA electronics package of claim 1 further  
comprising a hard disk drive apparatus contained within said  
body.
4. The PCMCIA electronics package of claim 2 further  
comprising a hard disk drive apparatus contained within said  
body.

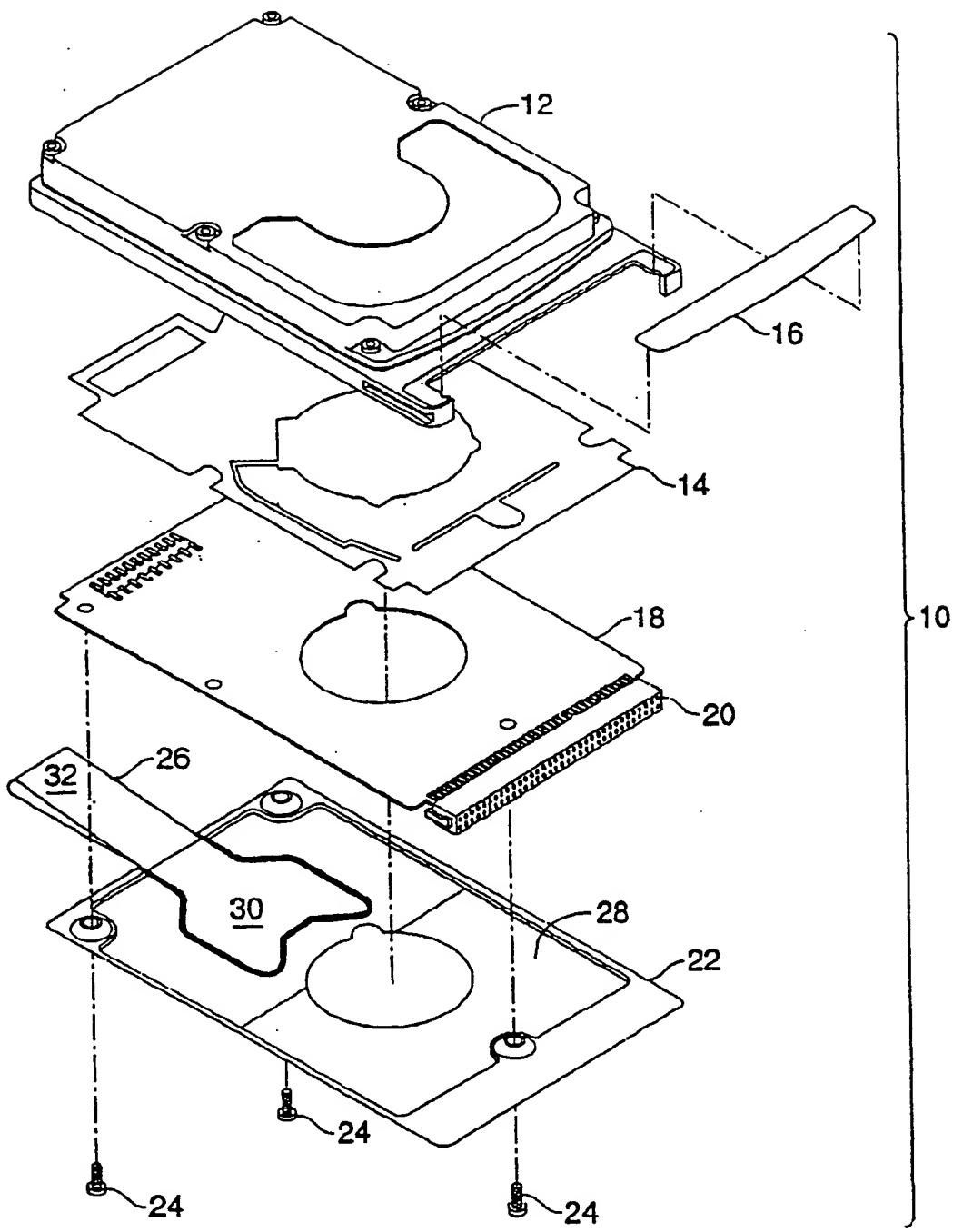


FIG. 1

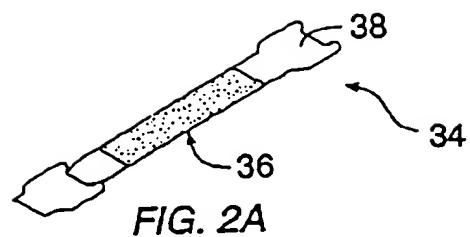


FIG. 2A

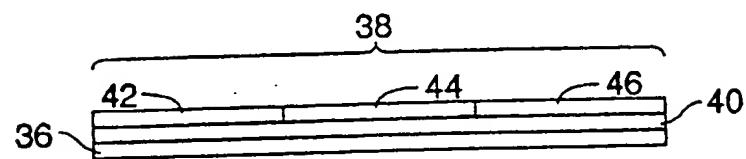


FIG. 2B

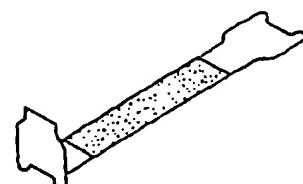


FIG. 2C

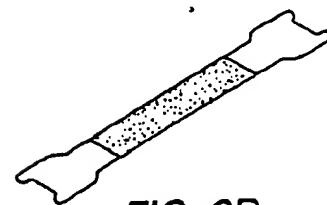


FIG. 2D

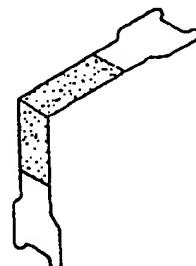


FIG. 2E

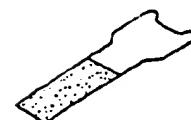


FIG. 2F

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US95/01938

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :G06F 1/16

US CL :361/685; 16/110R; 439/483

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 361/683-686, 725-731, 754, 798; 16/110R; 439/483, 484, 476, 928; 360/137; 312/223.2; 364/708.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 5,155,662 (I-SHOU) 13 October 1992, see the entire document.	1-4
Y	US, A, 4,310,208 (WEBSTER ET AL) 12 January 1982, abstract and column 8, lines 19-21.	1-4

 Further documents are listed in the continuation of Box C. See patent family annex.

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